



## Editors

Vladimir Marascu-Klein

Mihai Cruceru

Marian Ciontu



# **Advances in Environment Technologies, Agriculture, Food & Animal Science**

*Proceedings of the 2<sup>nd</sup> International Conference on  
Energy and Environment Technologies and Equipment (EEETE '13)*

*Proceedings of the 2<sup>nd</sup> International Conference on  
Agricultural Science, Biotechnology, Food and Animal Science (ABIFA '13)*

**Brasov, Romania, June 1-3, 2013**

## Scientific Sponsors





# **ADVANCES in ENVIRONMENT TECHNOLOGIES, AGRICULTURE, FOOD and ANIMAL SCIENCE**

**Proceedings of the 2nd International Conference on Energy and  
Environment Technologies and Equipment (EEETE '13)  
Proceedings of the 2nd International Conference on Agricultural  
Science, Biotechnology, Food and Animal Science (ABIFA '13)**

**Brasov, Romania  
June 1-3, 2013**

## **Scientific Sponsors:**



**Transilvania University  
of Brasov**



**University  
of Craiova**



**University Politehnica  
of Bucharest**



**Stefan cel Mare  
University of Suceava**



**Constantin Brancusi  
University of Targu-Jiu**



**Megatrend University  
of Belgrade**



**University Lucian Blaga  
of Sibiu**



**Constanta Maritime  
University**

# **ADVANCES in ENVIRONMENT TECHNOLOGIES, AGRICULTURE, FOOD and ANIMAL SCIENCE**

**Proceedings of the 2nd International Conference on Energy and  
Environment Technologies and Equipment (EEETE '13)**

**Proceedings of the 2nd International Conference on Agricultural  
Science, Biotechnology, Food and Animal Science (ABIFA '13)**

**Brasov, Romania  
June 1-3, 2013**

Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)

**Copyright © 2013, by WSEAS Press**

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.  
See also: <http://www.worldses.org/review/index.html>

ISSN: 2227-4359  
ISBN: 978-1-61804-188-3

# **ADVANCES in ENVIRONMENT TECHNOLOGIES, AGRICULTURE, FOOD and ANIMAL SCIENCE**

**Proceedings of the 2nd International Conference on Energy and  
Environment Technologies and Equipment (EEETE '13)**

**Proceedings of the 2nd International Conference on Agricultural  
Science, Biotechnology, Food and Animal Science (ABIFA '13)**

**Brasov, Romania  
June 1-3, 2013**



**Editors:**

Prof. Vladimir Marascu-Klein, Transilvania University of Brasov, Romania

Prof. Mihai Cruceru, University "Constantin Brancusi" from Targu-Jiu, Romania

Prof. Marian Ciontu, University of Craiova, Romania

**Reviewers:**

Vishnu Pratap Singh Kirar

Suzana Yusup

Chellali Benachaiba

Dayanand Kalyani

Niculae Boteanu

Liana Anica-Popa

José Nunes

John Antonopoulos

Ioana Diaconescu

Vasile Zotic

Borz Stelian Alexandru

Krisztina Uzuneanu

Elisa Bettencourt

Francisco Diniz

Francisc Popescu

Andreea Zamfir

Khashayar Tabari

Petr Mastny

Cristinel Racocanu

Denizar Cruz Martins

Dragoi Andreea

Lucija Foglar

Carlos E. Formigoni

Grabara Janusz

Mihaela Dudita

Gheorghe Manolea

Diana-Elena Alexandru

Adina Andreea Ohota

Tejinder Saggu

L. Gaceu

Hugo Cruz-Suarez

Julián Pucheta

Monica Dumitrascu

Rodica Badescu

Andrei Jean Vasile

Oguz Arslan

Ramin Khodafarin

Sara Sadrzadehrafiei

Chawla M. P. S. Chawla

Kamyar Mehranzamir

Alexander N. Pisarchik

Catalin Popescu

Khaled Galal Ahmed

Pablo Fdez-Arroyabe

Rosli Abu Bakar

Giri Kattel

Gherghinescu Sorin

Zohreh Salavatizadeh

Yang Zhang

Saeid Eslamian

Arion Felix

D. V. Ciobanu

Andrei Madalina-Teodora

Alina Adriana Minea

Zengshi Chen

Kannan Subramanian

Roger R. Riehl

Chi, Chieh-Tsung Bruce

Jose Manuel Mesa Fernández

Mojtaba Shivaie

I. C. Rosca

Harry Coomar Shumsher Rughooputh

Feridoun Nahidi Azar

Mahboobeh Mahmoodi

Davorin Kralj

Shahram Javadi

Corina Carranca

S. Vlase

Ahadollah Azami

Ozlem Coskun

Cristina Matos

W. Thierheimer

Manendra Pal Singh

Adrian Turek Rahoveanu

Heimo Walter

Maria De Fátima Nunes De Carvalho

Mohammad Al-Amri

Ioana Adrian

A. Fota

Dragos Ilie

Sorin Gherghinescu



**Preface**

This year the 2nd International Conference on Energy and Environment Technologies and Equipment (EEETE '13) and the 2nd International Conference on Agricultural Science, Biotechnology, Food and Animal Science (ABIFA '13) were held in Brasov, Romania, June 1-3, 2013. The conferences provided a platform to discuss energy production impact on ecological systems, energy efficiency, agricultural biotechnology, animal biotechnology, bioelectrical and neural engineering, bio-signal processing and analysis, pharmaceutical applications, protein modeling, enzyme engineering, food safety and hygiene, sustainable agriculture etc with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be sent to international indexes. They will be also available in the E-Library of the WSEAS. Extended versions of the best papers will be promoted to many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors



# Table of Contents

<b><u>Plenary Lecture 1: New Competitive Technology to Develop High-Effective Energy Sources</u></b>	13
<i>Ioana Diaconescu</i>	
<b><u>Processing Species Occurrence Records Supported by GIS on the Example of the White Carpathian Mts.</u></b>	15
<i>Vilém Pechanec, Jan Willem Jongepier, Ivo Machar</i>	
<b><u>Analytic Model of the Mobile Half-Bridge of a Circular Settling Tank</u></b>	21
<i>Emil M. Oanta, Cornel Panait, Gheorghe Lazaroiu, Anca-Elena Dascalescu</i>	
<b><u>Contamination with Heavy Metals of the Soil under the Influence of Heavy Traffic</u></b>	27
<i>Panaiteanu Mariana, Panaiteanu Fanel-Viorel</i>	
<b><u>Evaluating the Potential of Various Methods for the Rehabilitation of District Heating Systems</u></b>	37
<i>Liviu Ruieneanu, Cristian Bratu</i>	
<b><u>Ground Coupled Heat Pump Systems – A Key for a Sustainable Development of Heating and Cooling Buildings</u></b>	41
<i>Gabriel V. Bendea, Marcela F. Prada, Codruta C. Bendea, Calin D. Secui</i>	
<b><u>Analysis of Plate Heat Exchangers Situated in the Geothermal District Heating System – Iosia, Oradea</u></b>	47
<i>Crina Panea, Marcel Rosca, Vasile Moldovan, Gabriel Bendea, Adrian Ciobanca</i>	
<b><u>Effect of Temperature Drying upon Solid Wood Shrinkage for Norway Spruce</u></b>	56
<i>Aurel Lunguleasa</i>	
<b><u>Evaluations of Wind Potential in Dobrogea Plateau</u></b>	60
<i>Adrian Sabău, Darie Tudor</i>	
<b><u>Evaluation of Process Parameters of the Biological Stage of Wastewater Treatment Plant</u></b>	66
<i>Mariana Panaiteanu, Ileana-Irina Panaiteanu</i>	
<b><u>Correlation Between Entropy Generation and Internal Irreversibility Cycle under Maximum Power and Maximum Economy</u></b>	72
<i>Omocea Ion, Ciucur Violeta</i>	
<b><u>Optimizing the District Heating Network in Oradea Municipality – Energetic and Environmental Impact</u></b>	75
<i>Adrian Ciobanca, Ioan Felea, Gabriel Bendea</i>	
<b><u>Trigeneration in Tertiary Sector: A Case Study</u></b>	81
<i>Eduard Minciuc, Roxana Patrascu, Ioana Diaconescu</i>	
<b><u>Evaluation of Internal Recuperation of Heat from Flue Gasses Resulted from Urban Waste Incineration</u></b>	86
<i>Roxana Patrascu, Eduard Minciuc, Ioana Diaconescu</i>	

<b><u>Evaluation of Various WEC Devices in the Romanian Near Shore</u></b>	92
<i>Sorin Diaconu, Eugen Rusu</i>	
<b><u>The Reliability in Natural Gas Distribution Systems</u></b>	103
<i>Lucia-Maria Boeriu, Alexandru Serban, Mariana Fratu, Cristian Nastac</i>	
<b><u>Monitoring and Management of Energy in a Stand Alone Photovoltaic System</u></b>	107
<i>Ionel Laurențiu Alboteanu, Gheorghe Manolea</i>	
<b><u>Reduction of Turceni Thermal Power Plant Impact upon Environmental by Superior Valorisation of Ash and Slag</u></b>	112
<i>Popescu Luminita Georgeta, Mihai Cruceru, Cristinel Racocanu, Georgeta Predeanu</i>	
<b><u>Radiant Tubes Connected to Biological Waste Drying and Gasifying Chambers</u></b>	118
<i>Ioan Căldare, Cornel Muntea, Ioan Giurca</i>	
<b><u>Heat Obtained from Gas and Its Environmental Impact</u></b>	123
<i>Camelia Popa, Costel Mironeasa</i>	
<b><u>The Mathematic Model on Research Regarding Wool Dyeing with Natural Dyes Extracted from Green Walnuts</u></b>	131
<i>Monica Pustianu, Adina Bucevski, Cecilia Sirghie, Mihaela Dochia, Alexandru Popa, Erzsebet Airinei</i>	
<b><u>Research on Particulate Matter PM10 Pollution Due to Coal Burning in Oltenia Energy Complex</u></b>	137
<i>Cristinel Racocanu, Luminița-Georgeta Popescu, Cristinel Popescu, Mihai Cruceru</i>	
<b><u>Factors of Influence Combustion</u></b>	143
<i>Grîu Tatiana, Lunguleasa Aurel</i>	
<b><u>Environmentally Friendly Technologies to Waterproofing Rehabilitation for Building Infrastructure</u></b>	148
<i>Tamas Florin-L., Tuns Ioan</i>	
<b><u>Heat Load Calculation by Means of CTF vs. SR 1907</u></b>	152
<i>Cristian D. Năstac, Lucia M. Boeriu, Alexandru Serban, Nicolae F. Iordan, Sorin Bolocan</i>	
<b><u>Biomass Co-Firing in Existing Power Plants</u></b>	156
<i>Mihai Cruceru, Ion Pisc, Luminita Popescu, Bogdan Diaconu</i>	
<b><u>Promotion of Energy Efficiency and Renewable Energy Sources at Local Level. Case Study: Municipal Public Outdoor Lighting System</u></b>	162
<i>Mihai Cruceru, Mihai-Marius Voronca, Simona-Louise Voronca</i>	
<b><u>Influence of Glazed Area Size and Configuration on Indoor Thermal Comfort</u></b>	168
<i>Bogdan Marian Diaconu, Mihai Cruceru, Luminita Georgeta Popescu, Cristinel Popescu</i>	
<b><u>Aspects of the Influence of Internal Services of Groups with Relatively High Unit Power on Energy Efficiency</u></b>	174
<i>Cristinel Popescu, Luminița-Georgeta Popescu, Mihai Cruceru, Cristinel Racocanu</i>	

<b><u>Aspects of Voltage Drops on the Power Circuits of Electrostatic Dusting Equipment Entering in the Circuit Diagram of a Thermal Power of 330 MW Group</u></b>	178
<i>Cristinel Popescu, Florin Grofu</i>	
<b><u>Increasing the Performance of Electrical Installation for Removing Fly Ash from Flue Gas with the Purpose of Reducing the Impact upon Environment</u></b>	183
<i>Lucica Anghelescu, Luminita Georgeta Popescu</i>	
<b><u>Energy Balance of a Coal-Fired Power Plant in Condensing Operation</u></b>	187
<i>Ion Dosa</i>	
<b><u>Study Concerning Solar Sorption Refrigeration Systems for Residential Buildings</u></b>	193
<i>Alexandru Serban, Lucia Boieriu, Gabriel Nastase</i>	
<b><u>Box Window Double-Skin Façade. Experimental Model in Brasov, Romania</u></b>	197
<i>Gabriel Nastase, Robert Gavriluc, Alexandru Serban</i>	
<b><u>Ranking of the Power Quality Level at Boundary between Transmission and Distribution Networks</u></b>	201
<i>Denisa Rusinaru, Daniela Popescu, Marius Merfu, Leonardo Geo Manescu, Valeria Anghelina</i>	
<b><u>Aspects of Simulation of the Drum to the Steam Generator with Natural Circulation in Dynamic Regime</u></b>	207
<i>Adelaida Mihaela Duinea, Cristian Bratu, Catalin Duinea</i>	
<b><u>The Control of Variable Speed Pumps in Series Operation</u></b>	212
<i>Daniela Popescu, Adelaida Mihaela Duinea, Denisa Rusinaru</i>	
<b><u>Flue Gas Desulphuriation Using Jet Bubbling Reactor</u></b>	217
<i>Cornel Muntea, Ioan Caldare, Ioan Giurca</i>	
<b><u>Evaluation of Ash Utilization as a Reuse Material for the Ceramic Industry</u></b>	224
<i>Georgeta Predeanu, Enikö Volceanov, Traian Alexandru Abagiu, Luminita Georgeta Popescu</i>	
<b><u>Analysis of New Technologies Used for CCHP Systems</u></b>	230
<i>Krisztina Uzuneanu, Ioana Diaconescu</i>	
<b><u>Use of Wheat Flour Analytical Characteristics for Predicting the Simulator Mixolab Measurements</u></b>	235
<i>Georgiana G. Codină, Silvia Mironeasa, Costel Mironeasa</i>	
<b><u>Alveograph Dough Rheological Parameters Related to Wheat Flour Analytical Characteristics Using Principal Component Analysis</u></b>	240
<i>Silvia Mironeasa, Georgiana G. Codină</i>	
<b><u>Conventional and non-Conventional Extraction of Anthocyanins from Rubus Idaeus L. Grown in Romania</u></b>	247
<i>Simona Oancea, Cristian Grosu, Diana Coman, Mihaela Stoia</i>	
<b><u>Comparative Overview on Legislative Measures in Ecological Farming</u></b>	252
<i>Florin Fainisi</i>	

<b><u>Study Regarding the Optimization of the Bioscouring Treatment on 100% Cotton Materials</u></b>	258
<i>Iștoc Ioan Vișor, Pustianu Monica, Bucevschi Adina, Dochia Mihaela, Sirghie Cecilia</i>	
<b><u>Occurrence of Caffeine in Carbonated Drinks Cola Type from Romanian Market</u></b>	263
<i>Mircea Oroian</i>	
<b><u>Monitoring of the Vegetables Drying Process Using Infrared Images</u></b>	267
<i>L. Gaceu, B. Lepadatescu</i>	
<b><u>The Influence of Natrium Nitrite upon Meat Preparats Technological Properties and Their Shelf Life</u></b>	273
<i>Adriana Dabija, Iuliana Sion</i>	
<b><u>Researches Regarding the Beneficial and Pest Fauna of Invertebrate in the Corn Agricultural Ecosystem in Poplaca (Sibiu County)</u></b>	279
<i>Iuliana Antonie, Traian Manole</i>	
<b><u>Cuscuta spp in the Context of Sustainable Development – A Destructive or a Conservative Species?</u></b>	285
<i>Maria Tanase, Maria Gheorghe, Mirela Stanciu</i>	
<b><u>Study Concerning the Capitalization on Local Level of Traditional Products Obtained from Sheep, Sibiu County, Romania</u></b>	290
<i>Stanciu Mirela, Tănase Maria, Barbu Horia, Vlad Iulian, Blaj Robert, Sand Camelia, Gheorghe Gina</i>	
<b><u>Indicative Recognition Criteria of Degradation by Compaction of the Greenhouses Soils with Coarse Texture</u></b>	295
<i>Feodor Filipov, Costel Samuil, Vasile Vintu</i>	
<b><u>Testing the Effectiveness of some Environmental-Friendly Antibacterial Fabrics</u></b>	300
<i>Dana G. Radu, Cecilia Sirghie</i>	
<b><u>Study of Phenolic Compounds Adsorption from Wine on Silica Meso-Cellular Foam</u></b>	304
<i>Camelia Elena Luchian, Valeriu V. Cotea, Cintia Lucia Colibaba, Antoanela Patras, Marius Niculaea, Bogdan Nechita, Cătălin Zamfir, Maria Codreanu, Ioan Moraru</i>	
<b><u>In Vitro Germination of Gentiana Lutea L. Valuable Genotypes</u></b>	309
<i>Camelia Sava Sand, Maria-Mihaela Antofie, C. H. Barbu, M. R. Pop</i>	
<b><u>Analysis of the Agricultural Producers' Vision in Relation to Farm Development Ways in Arges County</u></b>	313
<i>Elena Stoian, Toma Dinu, Valentina Tudor, Marius Mihai Micu, Ionela Mițuko Vlad</i>	
<b><u>Study Regarding the Protective Effect of Rubus Fruticosus Anthocyanin Extract against Myoglobin Oxidation in Porcine Longissimus Thoracis, Semimembranosus and Bovine Longissimus Lumborum</u></b>	319
<i>Olga Drăghici, Simona Oancea</i>	
<b><u>Authors Index</u></b>	325

## Plenary Lecture 1

### New Competitive Technology to Develop High-Effective Energy Sources



**Professor Ioana Diaconescu**

Research Center for Mechanics of Machines and Technological Equipment  
“Dunarea de Jos” University of Galati  
Romania  
E-mail: [idiaconescu@ugal.ro](mailto:idiaconescu@ugal.ro)

**Abstract:** This paper presents some aspects regarding the strategic aims and priorities for development of new competitive scientific products and technologies, targeted at solving global energy and ecological problems. The leading tendency is directed to substitution of the traditional hydrocarbon fuels with alternative renewable energy sources. Significant part of the research is oriented in development of high-effective ecologically friendly energy sources, based on the concept of the so-called hydrogen economy and especially with the development of new types of fuel cells.

An increasing share of the research in the field of alternative energy sources is directed to the microbiological fuel cells. They use easily accessible natural substrates, during which oxidation electricity is generated. Their great potential is determined by the combination of technologies for electricity production and simultaneous use for soil or water purification, eco-monitoring, etc.

The most perspective application of the microbiological fuel cells is an electricity generation from the aquatic sediments, rich of organic matter. These are the sediment biofuel cells. One of the major advantages of these biofuel cells is that the electricity generation from river or marine sediments contributes to purification of water from organic and in some cases from inorganic pollutions by using ecologically friendly technologies.

Most sediment fuel cells have been tested in marine environments, and only a few in fresh-water reservoirs. This is because seawater has a higher electrical conductivity than river water and it has been suggested that marine sediment fuel cells are expected to produce greater electric power than river-water ones due to a lower electrolyte resistance. Similar sediment fuel cells have been tested for powering signalization systems in the open sea areas and they have been shown stable operational characteristics for a long time.

**Brief Biography of the Speaker:** Ioana Diaconescu received her Master's degree in Electrotechnics and Energetic from Polytechnic Institute from Bucharest, in 1987. She has earned her Ph.D in Advanced Engineering Thermodynamics from “Dunarea de Jos” University-Galati, in 1998. She is recognized as mechanical engineering associate professor at the department of Technical Sciences, Machines and Drives from “Dunarea de Jos” University from Galati and she teaches mainly Thermodynamics, Heat and Mass Transfer and Electrical Drives. Since 2001 she is a senior research at the Research Center for Mechanics of Machines and Technological Equipments and she focused her research activities during the last ten years to energy saving and trigeneration, mass and heat transfer (paper drying process), exergy and energy analysis of thermal processes, irreversible processes analysis, renewable energy and energy management. She is author of three books and more than 90 scientific papers published at international conferences and journals. She is Romanian and Bulgarian evaluator for R&D projects and also European evaluator for education's quality. Also, Ioana Diaconescu is reviewer for WSEAS papers and other prestigious journals.

Ioana Diaconescu was invited two times as visiting professor in City University of Honk-Kong-China, where developed a fruitful collaboration with Mathematical Department regarding PDEs in mass transfer issues (paper drying process). Dr. Ioana Diaconescu is an Expert of Romanian National University Research Council – CNCSIS and also an Evaluator of the Romanian Agency for Quality Assurance in Higher Education.